



Part 1: Calculating pH

Calculate the pH for each of the following solutions.

1. 0.00867 M HClO_4
2. 0.152 M HI
3. 0.00772 M $\text{Ba}(\text{OH})_2$
4. 0.000331 M LiOH
5. 1.54 g HNO_3 dissolved in 431 mL
6. 3.61 g $\text{Sr}(\text{OH})_2$ dissolved in 1.75 gallons
7. A 0.15 M weak acid solution with a percent ionization of 0.17% (bonus challenge: calculate K_a)
8. A 0.15 M weak base solution with a percent ionization of 0.17% (bonus challenge: calculate K_b)

Part 2: Understanding the pH scale and K_w

1. What is the $[\text{H}^+]$ concentration if $[\text{OH}^-] = 3.76 \times 10^{-4}$? Is this an acidic or basic solution?
2. What is the $[\text{H}^+]$ in a 0.00012 M NaOH solution?
3. What is the pH when $[\text{OH}^-] = 1.9 \times 10^{-3}$?

Part 3: Neutralization Reactions

1. What volume of 0.81 M $\text{Ba}(\text{OH})_2$ is needed to neutralize 1.78 L 0.052 M CH_3COOH solution?
2. A titration experiment is performed where 1.00 M NaOH is added dropwise to a 50 mL unknown weak acid solution. It takes exactly 12 mL of the NaOH solution to neutralize the weak acid solution.
 - a. How many moles of weak acid are in the solution?
 - b. What is the concentration of the weak acid solution?
3. Determine the relative pH (acidic, basic, or neutral) of the following salts:
 - a. LiCH_3COO
 - b. NaI
 - c. NH_4ClO_4

Last challenge question: The Dead Sea has a pH equal to about 5.8 and a volume of 3.01×10^{13} gallons. About many moles of H^+ are in the Dead Sea?